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Common Services Centres (CSCs) as an Approach to Bridge Digital Divide: Reflecting on Challenges and Obstacles

Yogesh K. Dwivedi
Swansea University Bay Campus, School of Management, Swansea, UK

Ganesh P. Sahu
Motilal Nehru National Institute of Technology Allahabad, India

Nripendra P Rana
Swansea University Bay Campus, School of Management, Swansea, UK

Monika Singh
Motilal Nehru National Institute of Technology Allahabad, India

Rajesh K Chandwani
Indian Institute of Management Ahmedabad (IIMA), Gujarat, India

Abstract

Purpose - Despite the increasing technological capabilities and its affordability, a significantly large proportion of developing nations' population are still lacking resources to own basic information and communication technologies (ICTs) such as computer and Internet. This suggests that majority of citizens from developing countries (for example, India) also not able to access and use emerging electronic government applications and services. This is leading to a further and bigger digital divide gap that already exists between rural and urban as well as economically less and more able population. In order to reduce widening digital divide, India has innovated Common Services Centres (CSCs) as means to deliver public services electronically to citizens at village level. This viewpoint article aims to discuss some of challenges and obstacles of such CSCs and offer some recommendations for their effective implementations and sustainable operations.

Design/methodology/approach **-** This is a viewpoint article that is based on authors' awareness of the context as well as knowledge and issues relevant to the research topic. A number of appropriate and current citations have been utilised to illustrate current state on the topic as well as to support authors' arguments presented in this paper.

Findings - The article identified a number of key issues relevant for effective implementation and sustainable operation of CSCs. We present our views and recommendations related to the following key issues: (1) Connectivity problems, (2) Lack of or delayed rollout of Government to Citizen (G2C) services, (3) Demotivated Village Level Entrepreneurs (VLEs) due to lack of G2C services, (4) Low computer literacy, (5) Lack of awareness about services and facilities; (6) Lack of adequate training and support; (7) Poor provisioning of an effective infrastructure, (8) Lack of support from the concerned government officials, (9) Inaccessible locations, (10) Burden of high investment, (11) Corruption at the government level, (12) Lack of skilled manpower to run the CSCs, (13) Lack of power supply, (14) Language barrier, (15) Lack of space, (16) Problem with maintenance and management of connectivity network, and (17) Problem caused by the Naxalite and anarchist activity.

Originality/value - The discussion and recommendations presented in this article would be valuable to various agencies (both from public and private sectors) as well as policy makers for an effective implementation and long term sustainability of CSCs. The approach

discussed in this article offers an effective way to diffuse e-government applications and services in other developing countries (particularly resource constraint nations) from African, Asian and Latin American regions.

Keywords: *Common Services Centres, CSC, Electronic Governance, e-Governance, Rural Connectivity, Remote Connectivity, Public Service Delivery, Village Level Connectivity, Village Level Entrepreneurs, Challenges, Obstacles*

Paper type: *Viewpoint*

Introduction

> *"If a huge section of the population is left out then a huge calamity may befall all of us in the form of Digital divide. If we don't spread this among the poor and in villages, our words of development shall ring hollow*."…**Shri Narendra Modi, Honourable Prime Minister of India** (Source: NDTV News, July 2015)

Presence of 'digital divide' is becoming more and more prevalent due to heterogeneous (i.e. unequal) diffusion of internet access to end users (i.e. citizens/consumers). This is particularly visible in developing countries with the resource constrains and where majority of population habitats in remote and/or rural areas (Freeman and Park, 2015; Rana et al., 2013; Waller and Genius, 2015; Walterova and Tveit, 2012). For example, India's nearly 70 percent of 1.2 billion population lives in rural and remote areas with no or little access to wired telephone line, computer/laptop and internet connections (The Hindu, 2011). Since late 1990s, government of a large number of (both developed and developing) countries across world (including India) have been investing large amount of resources (both financial and human resources) to develop and implement electronic government (e-government) systems and applications. The aim of such efforts was to modernise delivery of public service, reduce cost by improving efficiency and effectiveness, create transparency, minimise bureaucracy leading to better standards of living particularly for citizens from rural and remote areas (Dwivedi et al., 2012; 2013; 2015a). However, benefits of such systems yet to be fully realised in majority of countries particularly in developing and least developed countries. This is because end users (i.e. citizens particularly from rural and remote areas) are slow to adopt and use such systems (Rana and Dwivedi, 2015; Rana et al., 2015a, 2015b).

The two main barriers acting as impediment to citizen adoption and use of e-government applications and services are: (1) lack of underlying technologies (i.e. computer, laptops, telephones and Internet infrastructure) that are vital for access; and (2) lack of digital skills in rural population. As pointed above, these problems are more severe in developing nations such as India where majority of population still reside in geographically dispersed rural and remote areas with low degree of formal education leading to emergence of strong digital divide at various levels. Normal approaches (such as access via libraries in UK and other developed nations) to diffuse internet and enhance digital literacy are unlikely to be feasible and/or effective in many Asian (such as India), African and Latin American countries.

In order to reduce widening digital divide and enhance social inclusion (Chandwani and Dwivedi, 2015), India has innovated Common Services Centres (CSCs) as means to deliver public services electronically to citizens at village level in rural/remote areas. Conceptually this is an excellent innovation and possesses huge potential to improve quality and standard of rural living. However, early stages of implementation suggest that it also suffers with several challenges and obstacles. Existing studies on IS failure (for example, Dwivedi et al.,

2015b; Hughes et al., 2015) have argued that reasons why IS projects fail are complex and multi-factorial. Considering that this viewpoint article aims to explore and discuss possible challenges and obstacles faced when implementing and running CSCs in order to avoid failures in this critical initiative. The article also offers some recommendations for their effective implementations and sustainable operations. The discussion presented in this article is based on authors' awareness of the context as well as knowledge and issues relevant to the research topic. A number of appropriate and current citations have been utilised to illustrate current state of art on the topic as well as to support authors arguments presented in this paper. Authors of this paper also visited three CSCs, and observations from them have also been utilised to prepare this article.

The remaining parts of this article are structured as follows: next section will provide an overview of CSCs followed by discussion on challenges and obstacles are presented in Section 3. Section 4 presents recommendations and implications for policy makers for overcoming key challenges and obstacles as outlined in the previous section. Finally, Section 5 briefly presents key conclusions and recommends future lines of research in this area.

Common Services Centres (CSCs) – An Overview

Due to constant technological advancements and innovation in IT sector, the Government of India (GoI) has been very proactively applying it to the rural areas to bridge the urban and rural divide. The emergence of e-government as a force in developing India has driven to the discovery of numerous innovative ways of public service delivery to citizens and businesses with the prime focus on rural sector. The choice of CSCs based service delivery model is one of the key and commendable initiatives by GoI (Ebad, 2015). In other words, the GoI has introduced the concept of CSCs, which are ICT enabled front end service delivery points at the village level for delivery of government, financial, social and even private sector services in the areas of agriculture, health, education, entertainment, fast-moving consumer goods (FMCG) products, banking, insurance, pension, utility payments etc. (CSC Scheme, 2015; Sharma and Mishra, 2015).

These CSCs are manned by village level entrepreneurs (VLEs) involved in delivering the services to end users. These VLEs are expected to provide handholding functions and act as an interface between the citizens and the e-government portals. The CSCs scheme is based on the public private partnership (PPP) model that envisions a three-tier structure including the VLE catering to a cluster of 3-4 villages, the service centre agency (SCA), which would be responsible for a division of 500-1000 CSCs, and a state designated agency (SDA) identified by the state government responsible for managing the implementation in the entire state (CSC Scheme, 2015; Sharma and Mishra, 2015). A typical CSC infrastructure consists of 100-150 square feet of space, one or two PCs with legitimate pre-installed operating system and software, printers (inkjet or dot matrix), scanner, photocopier, digital or web camera, an uninterrupted power source, and an Internet connection (i.e., VSAT, fiber optic, DSL, or wireless) (CSC Scheme, 2015; Ebad, 2015). The government telecommunications operator called Bharat Sanchar Nigam Limited (BSNL) is building the broadband network across many states (Ebad, 2015).

The CSC project is a commendable effort by the government to bridge the gap in information as well as governance provisioning and delivery in rural India. It is an initiative to build a network of 1,00,000 business centres across villages in India (CSC Scheme, 2015). This project emerges as a new hope for the rural populace, as it aims to develop an opportunity to generate employment and self-respect for villagers in their home villages (CSC Scheme, 2015). Moreover, such initiative develops e-governance in rural India and promotes entrepreneurship (CSC Scheme, 2015). As the CSC project is the world's largest ICT project

in the second largest populous country, it has the strength to develop and educate people about the uses of ICT for improving the citizens' life (Dutta and Saxena, 2013). Under the recent Digital India programme, at least one CSC (preferably more than one) has been planned for 2,50,000 gram panchayats (i.e., villages) for delivery of various electronic services to citizens across rural India. This would include strengthening and integrating 1,00,000 CSCs and making operational an additional 1,50,000 CSCs in gram panchayats (CSC Scheme, 2015).

The CSCs enable (at grassroots level) the three vision areas of Digital India programme including digital infrastructure as a core utility to every citizen, governance and services on demand, and digital empowerment of citizens. CSC e-governance services India limited is a special purpose vehicle (CSC SPV) included under the Companies Act, 1956 by the department of Electronics and Information Technology (DeitY), GoI to monitor the implementation of CSCs (CSC Scheme, 2015). CSCs are operational across 36 states and union territories of India. The major focus of establishing the CSCs is the rural areas, with urban CSCs comprising only 9% of the total numbers (CSC Scheme, 2015; Digital India, 2015).

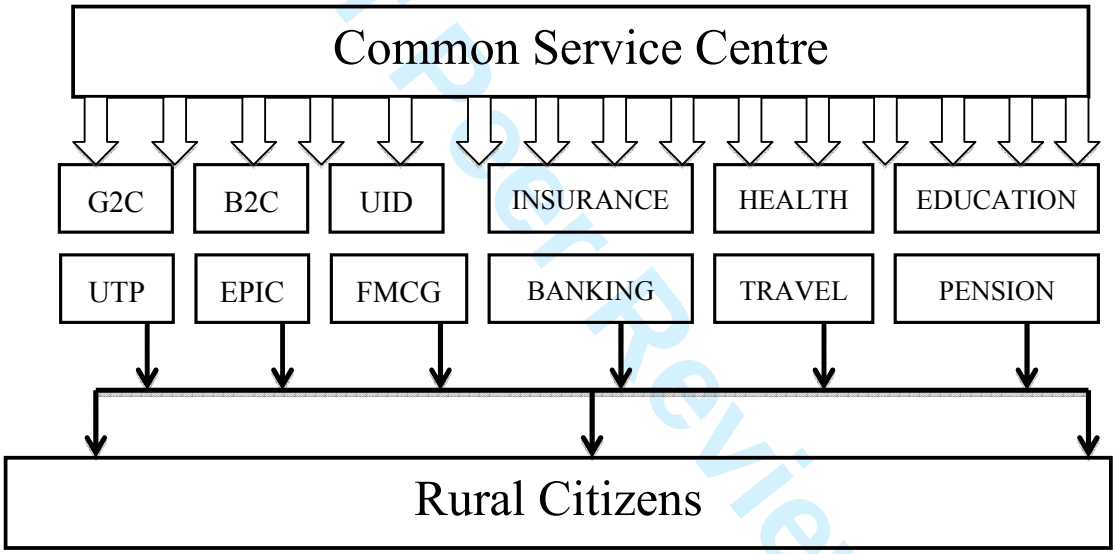

Figure 1. Services provided by CSCs [Legend: B2C: Business-to-Consumer; EPIC: Electoral Photo Identity Card Project, FMCG: Fast-Moving Consumer Goods, G2C: Government-to-Consumer Services, UID: Unique Identity Card (Aadhar Card), UTP: Utility Payments] [Source: Drawn based on information provided by CSC Scheme, 2015]

Challenges and Obstacles

Actual potential of digital intermediaries (such as CSCs) is difficult to realise due to several challenges and obstacles that they are facing. In order to form some understanding of the challenges and obstacles CSCs are facing, the researchers visited three CSCs situated in Pratapgarh and Allahabad district of Uttar Pradesh (UP), India. The visit was conducted during September 2015 and the researchers spent about one to two hours with the owner (also known as VLEs) of each CSC. Out of three CSCs, two were non-functional from last three years and only one was truly operational in terms of offering government services electronically to citizens. First, the non-functional CSC that we visited was located in Pratapgarh district. The owner explained that it was established for his daughter and it

became non-functional as she got married after a year of its establishment. Although from last three years it has been non-functional, this CSC still exists in the list of active CSCs and the owner curiously asked us how to close it. Second, a non-functional CSC was based in a rural town within Allahabad district and was still operational but had seized all normal services, which were replaced by tourism related commercial services including electronic reservation and ticketing of coaches, trains and flights. Such non-functional and failed CSCs are reported in other sources and few such examples are briefly mentioned below. Third was a functional CSC based in a remote rural town of Allahabad district, which was continuing its old services and was also in the process of introducing new innovative advanced services such as telemedicine. The observations made from these CSCs are implicitly utilised in discussion presented below.

Hindustan Times recently reported that in Punchkula district of Haryana, India, a CSC running through Punchkula Municipal Corporation is failed due to the lack of required equipment, which results in hindering e-government services to citizens (Hindustan Times, May 20, 2015)**.** The CSC at Sector-14 of the city i.e., the Civic Body Office is established to provide e-government services related to marriage, birth and death certificates, but they did not have color printers, digital camera and scanners to do so. The CSC had even a very slow/no Internet connection, which forced the employees to use their own Internet dongles (private companies instead of BSNL), which further encountered the problem of frequent connection breakages, resulted in backlogs of more than 1000 of certificates (Hindustan Times, May 20, 2015).

In order to fetch out more factual study, one of the researchers personally visited Mumbai during December 2015 and held discussions with employees working with insurance companies and dealing with CSCs. The companies are facing problems in dealing with CSCs due to their poor infrastructure, poor Internet connectivity and unprofessional behaviour (as many VLEs have opted this job as a part-time low-priority job and indulge mainly in some other jobs like painting, bicycle repair shops etc.).

Based on the cases mentioned above, the article hereafter briefly discusses a number of key issues (also listed in Table 1) relevant for effective implementation and sustainable operation of CSCs. We present our views and recommendations related to the following key issues (also see Table 1): (1) Connectivity problems, (2) Lack of or delayed rollout of G2C services, (3) Demotivated VLEs due to lack of G2C services, (4) Low computer literacy, (5) Lack of awareness about services and facilities; (6) Inadequate training and support; and (7) Inadequate provisioning of an effective infrastructure, (8) Lack of support from the concerned government officials, (9) Inaccessible locations, (10) Burden of high investment, (11) Corruption at the government level, (12) Lack of skilled manpower to run the CSCs, (13) Lack of power supply, (14) Language barrier (15) Lack of space, (16) Problem in maintenance and management of connectivity network, and (17) Problem caused due to Naxalite and anarchist activity.

A number of studies (e.g., Basu, 2004; Cecchini and Raina, 2004; Dass and Bhattacherjee, 2011; Dutta and Saxena, 2013; Ebad, 2015; Kaur, 2012; Sharma and Mishra, 2015) have explored the issue of connectivity problem affecting optimal functioning of the CSCs. For example, exploring the 'Gyandoot' project in drought-prone rural district of Dhar in Madhya Pradesh, Cecchini and Raina (2004) found that connectivity was a major issue as the main database server was sometimes down for more than a week. Dass and Bhattacherjee (2011) highlighted that the percentage of villages with phone connection is very low across all the Indian states. This created an acute problem in providing Internet connection to the CSCs in the villages, as broadband has not been made available to the rural areas yet. The authors also

argued that the lack of adequate power supply is also one of the reasons for the problem of connectivity in the rural area of the some of the states of India including Jharkhand, Assam, Bihar, Madhya Pradesh, and Uttaranchal. Providing the overall statistics of Internet connectivity, Dutta and Saxena (2013) stated that although the government figure of rolling out 97, 439 CSCs out of the planned 1,00,00 CSCs was quite impressive, the actual situation was somehow different. Providing the further statistics, the authors further highlighted that only 67,883 were provided with Internet connectivity until April 2011. The figure clearly indicates the problems of connectivity and improper functioning of around 29,556 CSCs (Dutta and Saxena, 2013). Exploring critical factors hindering the CSC rollout across Indian states, Kaur (2012) highlighted the issue of connectivity across almost every state. Kaur (2012) specified the lack of connectivity as one of the state-specific factors resulting in success or failure of the substantial ventures like CSCs. Sharma and Mishra (2015) also accepted that the project of effective implementation of CSCs is delayed mainly due to the lack of connectivity and availability of government services in the specific regions. This problem still persists as authors observed this from all three CSCs they visited. The owner of the third functional CSC cited slow Internet access as a major bottleneck for delivering emerging innovative electronic services and expressed his frustration for not able to be connected with the fibre optic network.

The lack of power supply in the rural regions is another issue that impedes the successful implementation of the CSCs in India. Dass and Bhattacherjee (2011) stated power supply as one of the key bottlenecks in the sustainability of the CSCs. The VLEs are forced to match their working hours in a week with the availability of power supply (Dass and Bhattacherjee, 2011). Some other studies (e.g., Dutta and Saxena, 2013; Ebad, 2015; Pathak and Barnwal, 2013) have also mentioned the problem caused by inadequate power supply as one of the key issues in effective implementation of CSCs in the country. This was also clearly noted as a major bottleneck from three CSCs that authors visited.

A lack of or delayed rollout of G2C services is the other challenge that CSCs are facing (Dass and Banerjee, 2011; Ebad, 2015; Pathak and Barnwal, 2013; Prasad and Ray, 2012). These studies argued that the rollout process for CSCs got delayed due to unavailability of G2C services for them to be implemented through the centres. The demotivation of the VLEs to run the CSCs is also one of the challenges that emerge from the lack of G2C services (Dass and Bhattacherjee, 2011; Kaur, 2012). Dass and Bhattacherjee (2011) observed that even the states that have achieved hundred percent implementation status, have not got all their CSCs operational and claimed that this has been largely due to highly demotivated VLEs. Kaur (2012) argued that most of the G2C services had gone astray or were in subsidence from the scheme that demotivated numerous VLEs to execute their operations for continued sustainability of the CSCs. The authors visited all three CSCs noted that the availability of variety of G2C services (in the form of Killer application) is essential to bring the end users to CSCs, which in turn is critical for their income generation and sustainability. One of the major reasons for two of three CSCs to become non-functional was an inadequate number of G2C services that can be offered. The functional CSC described its struggle for convincing a local government official to provide some of the services to citizens using CSC as a channel. Overall, it can be firmly concluded that the lack of adequate G2C electronic services is a critical bottleneck contributing towards failure to mobilise citizen demands for CSCs.

Dass and Bhattacherjee (2011) found that a number of CSCs got delayed in their rollout due to unavailability of loans for the VLEs. VLEs are generally villagers with relatively low income, hence the provision to access financial resources and subsidies are essential for their initial setup that requires purchase of expensive ICT systems and equipment.

A low computer literacy in the rural part of India is the other major drawback for the CSCs to function properly (Dass and Bhattacherjee, 2011). Analysing the computer skills for the VLEs in the states of Meghalaya and UP, Prasad and Ray (2012) outlined that there was a lack of computer literacy among the VLEs themselves to carry out their jobs properly. They emphasised computer literacy to end-users as a significant function the government needs to enable through CSCs (Ebad, 2015; Kaur, 2012). The similar challenges were the lack of required expertise, training, and project management skills among the VLEs (Ebad, 2015; Kaur, 2012). There are inadequate numbers of people trained in appropriate technology (Basu, 2004). Kaur (2012) believed that VLE conscription with precise skilfulness has not been taking place due to low-set literacy rates in the alarmed areas of the country. Ebad (2015) found that organising training sessions to build VLEs' capacity to operate the centre, address their grievances, help them getting acquainted with the different services introduced to their CSCs, and help them to increase their per capita income to ensure the sustainability of the centres were indeed some of the daunting tasks still faced by the governments. These issues were predominantly highlighted by the three CSCs visited by the authors.

Lack of awareness by the government to promote the benefits of CSCs among their potential users (i.e. citizens) is the other challenge for the effective functioning of such centres (Dutta and Saxena, 2013). A poor literacy level is one of the reasons to give rise to issues of awareness (Dass and Bhattacherjee, 2011). Lack of awareness can be seen with regard to VLEs as well as the users of the e-government services provided through CSCs. Kaur (2012) highlighted the lack of awareness regarding IT in general and CSCs (their role and benefits) in particular among rural citizens. VLEs also face the lack of awareness about the projects and their effective implementations due to the lack of appropriate levels of skills and expertise required to implement them. This was also emphasised as a critical issue by CSCs visited by authors. For example, two of the non-functional CSCs were not aware that some of the service delivery organisations were providing free training and requisite equipment to CSCs before activating their services for delivery to citizens. Considering discussion presented in above two paragraphs, it is clear that both IT literacy and awareness problem persist at two different levels (i.e. citizen and CSCs).

Poor infrastructure leads to immense operational cost for the CSCs, which eventually affects the financial sustainability of the CSCs particularly in the initial years of their operations when the revenue earned is substantially low (Dass and Bhattacherjee, 2011). Lack of ICT infrastructure in villages appears to be critical to the assimilation of e-government services in the rural India. Without the availability of technical infrastructure, e-government implementation through the CSCs to the villages in India will be an unrealistic programme (Kaur, 2012; Srivastava and Teo, 2006). Lack of proper infrastructure is a grave concern as far as connecting the poor through electronic services in villages is concerned (Kaur, 2012).

Absence of support from the district and block level officials (Kaur, 2012; Pathak and Barnwal, 2013) and corruption at the government level (Dass and Bhattacherjee, 2011; Ebad, 2015) are the other major challenges for the effective implementation of the CSCs in villages across the country. Ebad (2015) claimed that most of the government officials were found to be very much against the change and were seemed unwilling to cooperate or support the program, or even rejected it completely. They feared loss of power and citizens taking complete control of the whole system. This issue was strongly emphasised by third functional CSC visited by authors, it was noted that it took a number of years, and several meetings and follow-ups to convince local officials that CSCs are valid channels for accessing public services electronically. All three CSCs raised the issue of trust at various levels i.e., between citizen and CSC; between CSC and officials; between CSCs and service delivery organisations; and between CSC and SCA/SDA.

Inaccessible terrains (Dass and Bhattacherjee, 2011) and language barriers (Dutta and Saxena, 2013; Paul and Paul, 2014) (Dutta and Saxena, 2013; Kaur, 2012) are some other challenges faced by the CSCs toward their implementations. Dass and Bhattacherjee (2011) stated that some of the villages are located in such inaccessible locations that it was impossible to open a centre in that area. It is unfortunate given that people living in those areas have a greater need of easily accessible government services (Dass and Bhattacherjee, 2011). Dutta and Saxena (2013) highlighted the lack of local language interface in the software as an issue for end users to understand the information provided by the government. In fact, language is one of the key obstacles to link the rural population to the Internet, as the majority of the rural people in India cannot handle the English language (Paul and Paul, 2014). Also, the lack of adequate training to the VLEs so that they can properly operate the system and get the end users' work done is yet another issue that CSCs are facing. Kaur (2012) also accepted that the lack of qualified staff and training schemes, which are compulsory conditions for the successful e-government services, is a grave setback for the successful functioning of the CSCs in India. For readers' convenience, various issues/challenges/obstacles/bottlenecks related to CSCs discussed above are also listed and summarised in Table 1.

Table 1. Challenges/obstacles of successful implementation for CSCs

Challenge/Obstacle	**Key remark**	**Citation(s)**
Lack of or delayed rollout of G2C services	Non-availability of G2C services	Dass and Bhattacherjee (2011), Ebad (2015), Pathak and Barnwal (2013), Prasad and Ray (2012)
Demotivated village level entrepreneurs (VLEs) due to lack of G2C services	Due to non-availability or delay in starting G2C services, VLEs got demotivated leading to their premature exit from the project	Basu (2004), Dass and Bhattacherjee (2011), Kaur (2012), Ndou (2004)
Low computer literacy	Little computer awareness	Dass and Bhattacherjee (2011), Prasad and Ray (2012), Sharma and Mishra (2015), Choudhury and Gosh (2015)
Burden of high investment	Substantial initial investment in creating CSCs infrastructure	Dass and Bhattacherjee (2011), Ebad (2015)
Lack of awareness about the CSCs in general and projects in particular	Poor knowledge about the CSCs, its services, and facilities	Cecchini and Raina (2004), Dass and Bhattacherjee (2011), Dutta and Saxena (2013), Ebad (2015), Kaur (2012)
Connectivity problems	Issues of Internet or alternate (e.g., WiMax) connectivity	Basu (2004), Cecchini and Raina (2004), Dass and Bhattacherjee (2011), Dutta and Saxena (2013), Kaur (2012), Ebad (2015), Kumar and Best (2006), Sharma and Mishra (2015)
Absence of support from district and block level officials	Lack of support from the concerned government officials	Kaur (2012), Pathak and Barnwal (2013)
Inaccessible terrain	Inaccessible locations	Dass and Bhattacherjee (2011), Agarwal (2014), Ebad (2015)
Poor infrastructure	Lack of provisioning of an effective infrastructural facilities	Basu (2004), Cecchini and Raina (2004), Dass and Bhattacherjee (2011), Kaur (2012), Prasad (2012), Choudhury and Gosh (2015)

Corruption at the government level	Fraud and bribery at the various levels in government toward establishing and managing CSCs	Dass and Bhattacherjee (2011), Ebad (2015)
Lack of required expertise and project management skills	Lack of skilled manpower to run the CSCs	Dass and Bhattacherjee (2011), Kaur (2012), Ebad (2015), Choudhury and Gosh (2015)
Lack of power supply	Less supply of electricity in the rural areas	Cecchini and Raina (2004), Dass and Bhattacherjee (2011), Dutta and Saxena (2013), Ebad (2015), Pathak and Barnwal (2013), Agarwal (2014), Choudhury and Gosh (2015)
Language Barrier	E-government services available in only limited languages	Dutta and Saxena (2013), Paul and Paul (2014), Chandra and Malaya (2011), Choudhury and Gosh (2015)
Lack of training for VLEs	No proper training for VLEs	Dutta and Saxena (2013), Kaur (2012)
Lack of space	No space or little space to establish CSCs	Choudhury and Gosh (2015), (Hindustan Times, 07/01/2015)
Maintenance and management of connectivity network	Internet connectivity in rural areas especially in difficult terrain requires regular management	Raja et al. (2012), Csc.gov.in
Naxalite and anarchist activity	No or very slow work progress in naxal areas	Csc.gov.in, Ebad (2015), Dass and Bhattacherjee (2011)

Recommendations and Implications for Policy Makers

The CSC initiative is a great effort by the GoI to bridge the gap of information and governance in rural India. This initiative is a new hope for the rural population, as it aims to provide citizens with convenient access to electronic services as well as to develop the opportunity to earn money and self-respect for the VLEs in their rural homes. Although this initiative develops e-governance in rural India and promotes entrepreneurship (as discussed above), it is suffering from a number of major bottlenecks (Dutta and Saxena, 2013). Considering the obstacles/challenges toward successful implementation of the CSCs, below are some recommendations that can help different stakeholders to make this initiative widely diffused and adopted. For example, the problem regarding a lack of awareness, there is a need for a full-fledged awareness campaign about the services offered at CSCs and its benefits to the rural population. For such campaign to be successful, there should be a high-level promotional campaign of the stature of Pulse Polio Awareness started by the GoI during 1995-96 (Dutta and Saxena, 2013). Also government should also intervene more actively in such campaigns and closely monitor the developments made in this direction (Ebad, 2015). Ebad (2015) indicated one such specific awareness and sensitization campaign already implemented using mobile vans travelling to distant places and the results for this were found to be promising. It is important that there should be two levels/types of campaigns to be launched: the first one should target the CSC owner to make them aware about available G2C services as well as training provisioning available to them for skill development; and the second type of campaign should target citizens directly for their awareness about services available to them, which should be promoted by both government agencies and the owner of CSCs preferably using joint efforts.

As far as the issue of connectivity is concerned, Dutta and Saxena (2013) suggested for the need for the fast deployment of high-speed connections around the CSCs. It was suggested to

the government to do partnerships with private broadband service providers for fast connection across the Indian villages. The government can fix deadlines to such companies for providing connectivity to the agreed areas (Dutta and Saxena, 2013). Kaur (2012) suggested exploring alternate connectivity options like WiMax to overcome lack of connectivity. Ebad (2015) also suggested the governments to become more flexible in helping the SCAs to find alternatives to the current unavailability of government provided connectivity. These all are useful but time and resource consuming recommendations as, it would be cumbersome and impractical (economically) to connect all villages with high speed Internet. Instead, the government may consider connecting CSCs with educational networks that many Indian states currently developing or have developed. This would be a fast and economical solution.

To overcome the issues related to lack of training, the government should design and implement specific training programs for VLEs that could help them in customer relationship management, revenue generation, effective exploration of the website, record maintaining, and for creating awareness amongst villagers. The government should also propose special awards and recognition schemes for the VLEs so that the entrepreneurship at the village level can be promoted (Dutta and Saxena, 2013). It has also be recommended that providing the adequate training to the VLEs in the alternative system and software handling (such as using mobile apps to get government services when there is no proper G2C service is available) to fulfil customers' requirements to compensate for the lack of or delayed G2C services can also be critical considering that VLEs play a key role in the sustainability of the CSCs (Dass and Bhattacherjee, 2011). Also motivational and awareness programs should run to make the VLE as well as habitants more enthuse to participate/run CSCs.

To overcome the issue of the frequent power failure, installing generators or inverters can be one solution, however, it remains an issue for such villages, which do not have any electricity at all, as generators, or inverters cannot be the permanent alternative for the electricity because it is very expensive to operate on that basis (Dass and Bhattacherjee, 2011; Dutta and Saxena, 2013; Ebad, 2015). The solar panels can be expensive in their installations but they could be an effective alternative (based on India's climatic conditions) if government can provide subsidy or loan to support VLEs to install them. As far as the issue of initial investment in opening up the CSCs is concerned, it has been seen that such CSCs where SCAs have initiated the complete investment without letting VLEs involve into it have been more successful in making the centres sustainable (Dass and Bhattacherjee, 2011). We also believe that the government should fully bear the complete cost of opening the CSCs in villages and appoint VLEs to work in these centres with providing them the adequate training. The VLEs should be rewarded based on their performance in terms of the number of transactions performed and should be able to free up their CSCs subject to reaching the maximum threshold of their performance. Also, there is requirement of users and capacity survey periodically to find out the issues and their remedial measures.

Conclusions

The purpose of this viewpoint article was to explore and discuss some of challenges and obstacles of Common Services Centres (CSCs) as well as to offer some recommendations for their effective implementations and sustainable operations. The content of this article is informed by authors' awareness of the context as well as knowledge and issues relevant to the research topic. This article has utilised a number of appropriate and recent citations to illustrate current state on the topic and to support arguments. The article identified a number of key issues relevant for effective implementation and sustainable operation of CSCs that consist of: Connectivity problems; Lack of or delayed rollout of G2C services; Demotivated

VLEs due to lack of G2C services; Low computer literacy; Lack of awareness about services and facilities; Lack of adequate training and support; Lack of provisioning of an effective infrastructure; Lack of support from the concerned government officials; Inaccessible locations; Burden of high investment; Corruption at the government level; Lack of skilled manpower to run the CSCs; Intermittent power supply; Language barrier; Lack of space; Problem with maintenance and management of connectivity network; and Problem caused due to Naxalite and anarchist activity. The article has provided several recommendations that would be valuable for various agencies (both from private and public sectors) as well as policy makers for an effective implementation and long term sustainability of CSCs. The approach offered in this article can also serve as an effective way to diffuse electronic applications and services (including e-government services) in rural and remote areas of other developing countries (particularly resource constraint nations from African, Asian and Latin American regions).

This article is a viewpoint mainly based on authors' understanding of the context, observations published in existing literature and a brief observation of three CSCs made by authors. This work can be further extended by in-depth ethnographic observations and case studies to categorise such obstacles from different stakeholders' perspectives. Also, this study can be further extended to examine the extent to which such CSCs contribute to the rural development, poverty reduction as well as a means to reduce social inclusion by bridging digital divide.

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Authors' Bio

Dr Yogesh K. Dwivedi is a full Professor and Director of Research in the School of Management at Swansea University, UK. He obtained his PhD and MSc in Information Systems from Brunel University, UK. He has co-authored several papers, which have appeared in international refereed journals such as CACM, DATA BASE, EJIS, IJIM, IJPR, ISJ, ISF, JCIS, JIT, JORS, TMR and IMDS. He is Associate Editor of European Journal of Marketing, European Journal of Information

Systems and Government Information Quarterly, Assistant Editor of JEIM and TGPPP, Senior Editor of JECR and member of the editorial board/review board of several journals.

Dr Ganesh P. Sahu is an Associate Professor, Motilal Nehru National Institute of Technology Allahabad, India. He completed his one-year Post Doctoral program from California State University Monterey Bay, California US and PhD in Management from Indian Institute of Technology Delhi, India. His research interests are in the areas of MIS and E-governance. Dr. Sahu has published around 80 research papers in international journals and conferences. He has coordinated a few international conferences. He has also edited five books in the area of E-governance. Dr. Sahu has acted as a reviewer for international journals. He is also a Guest Editor with International Journal of Electronic Governance. Dr. Sahu has been on the jury for the CSI-Nihilent E- governance National Awards, India. He is convener for CSI-Nihilent E-governance National Awards for E-Districts.

Dr Nripendra P. Rana is a Lecturer at the School of Management of Swansea University in the UK. He holds a BSc, an MCA, an MTech, and an MPhil degrees from Indian universities. He also obtained his MBA (distinction) and PhD from Swansea University, UK. His current area of research is in information systems/technology adoption. He has co-authored articles, which have appeared in international refereed journals such as EJM, ISF, GIQ, ISM, JEIM, and JME. He also has a varied work experience of teaching in the area of computer engineering and applications at undergraduate and postgraduate levels. He also possesses a good experience in the field of software development.

Ms Monika Singh is a Research Scholar at School of Management Studies, Motilal Nehru National Institute of Technology Allahabad, India. She is pursuing her research in field of MIS. Her research area includes – e-governance, m-governance and Information Systems. She holds Post Graduate Degree in Business Management and Under-graduate in Electronics and Communication Engineering. She has more than five-year experience in teaching management courses.

Dr Rajesh Chandwani is an Assistant Professor at the Indian Institute of Management Ahmedabad in the Personnel and Industrial Relations area. His long-standing interest in the issue of inequality in distribution of health care facilities across urban and rural areas has its roots in his experience as a paediatrician. His research focuses on scaling-up of healthcare services, and role of ICT in improving the access, quality and affordability of healthcare services.